U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: ACTION: Review and Concurrence, Equivalent Level of Safety Finding for 14 CFR 25.613 at Amendment 25-72 for the Boeing Model 767-200 Tanker / Transport Combi, FAA Projects ST3067WI-T, ST3068WI-T, ST3069WI-T, ST3072WI-T, ST3482WI-T, ST3073WI-T

Date: 8/28/2003

Reg Ref: § 25.613, Amdt 25-72

From: Manager, TSS Airframe/Cabin Safety Branch, ANM-115

Reply to Attn. of: Gary Park, ACE-118W

To: Manager, Wichita ACO, ACE-115W

ELOS Memo #: ST3073WI-T-A-2

Background
Boeing has requested an Equivalent Level of Safety (ELOS) Finding for 14 CFR 25.613 at Amendment 25-72 for the 767-200 Tanker / Transport Supplemental Type Certificates (STCs) ST3067WI-T, ST3068WI-T, ST3069WI-T, ST3072WI-T, ST3482WI-T, and ST3073WI-T.

Section 25.613 requires that material strength properties be based on a sufficient number of tests to establish a statistical basis for the design values. For single load path structure, this regulation requires that the design values must be established with a 99% probability and 95% confidence. For multiple load path structure, the design values must be established with a 90% probability and 95% confidence.

Boeing occasionally has used materials that do not have design values based on testing to establish the values with the required probability and confidence. Many of these materials have been extensively tested, but statistically based design values may not have been established. The materials have been used in service for many years with no adverse service history. Boeing's approach is to use the "S" allowable materials method.

An ELOS to § 25.613 allows the 767-200 Tanker Transport to be modified to the previously designed and certified standards of other existing Boeing airplanes. Applying the "S" allowables method described in this issue paper provides a level of safety equivalent to, or better than that provided by the requirements of § 25.613.

Applicable Regulation(s)
§§ 25.613, Amendment 25-72

Regulation(s) requiring an ELOS
§§ 25.613, Amendment 25-72

Description of compensating design features or alternative standards, which allow the granting of the ELOS
The "S" allowable materials method will be used in the design of the 767-200 Tanker Transport to meet the latest FAR requirements.

Explanation of how the design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation.
The static design allowables for new structural materials and existing structural materials in new applications on previous 767 aircraft are substantiated in Boeing documentation.

ACO recommendation for approving the ELOS
The FAA has approved a similar Equivalent Level of Safety Finding for a 767-400ER project. For those material which do not explicitly comply with § 25.613, the noncompliance is compensated for by the type of statistical basis that is used by Boeing to accept "S" allowable materials, i.e. the factor that provides an equivalent level of safety for the 767-200 Tanker Transport projects cited herein. This finding is supported by the following rational:

- The design values used are equal to or less than the "S" basis values (or specification values).
- Data is available to support the material specification used (BMS, AMS, MIL & QQ-A).
- Materials are procured to a specification; i.e., Boeing Standards (BMS), Industry standards (AMS), or Government standards (MIL & QQ-A), which define the minimum properties and identify the testing needed to ensure these properties.
- Materials are procured from suppliers that have demonstrated the ability to produce the material by meeting all of the specification requirements.
- The Boeing supplier quality system ensures statistical process control and specification conformance.
- Boeing Quality Assurance oversees all materials received.
- The fabrication of components and materials whose failure would cause extensive damage to the aircraft, or are made from new materials or processes, or whose replacement would result in very high cost, are subject to additional requirements.
- The materials have a successful history in the Boeing Fleet, aircraft industry, and component testing.

/s/

Signature: Alan Sinclair
Manager, TSS Airframe/Cabin Safety Branch, ANM-115

Date: August 28, 2003